3. Release A Operational Activities

This section provides operations scenarios and displays that are * in the Table of Contents for Release A operational activities documented in the ECS Operations Concept Document for the ECS Project - Part 2A, Release A.

3.1 Computer System Administration Activities

3.1.1 ECS System Shutdown/Startup Scenario

3.1.1.1a Shutdown Scenario Description

We have broken the scenario down into two unique parts. The first scenario covers shutdown and the second scenario covers startup. In this example, the Systems Administrator is the ECS personnel involved. The definitions and roles of the Systems Administrator are taken from the Maintenance and Operations Manual for the ECS Project (607-CD-001-001) and/or The Maintenance and Operations Configuration Management Plan for the ECS Project. The reason that only the Systems Administrator is required is because we are assuming that the shutdown has been scheduled well in advance, it will occur during off hours and the Systems Administrator has been properly trained to handle all aspects of a system shutdown. This shutdown takes place at the GSFC DAAC and is referring to a shutdown of the components at the GSFC DAAC. In this scenario the System sends out notifications, (as a reminder for the event that has been scheduled well in advance) to all operators at shutdown minus thirty minutes, shutdown minus 15 minutes and shutdown minus 1 minute. Then at the scheduled shutdown time the Systems administrator will block all of the incoming requests from the gateway. The Systems Administrator will then shut down only remaining jobs. The systems Administrator will then begin shutting down the subsystems in the predefined order of shutdown. The Computer Operators are sent messages to notify them of the shutdown.

3.1.1.2a Frequency

We estimate that during the early stages of ECS this will occur once every 3-4 months. However after the system stabilizes we estimate that this will occur more like once a year.

3.1.1.3a Assumptions

The assumptions underlying this scenario (shutdown) are as follows:

1. The shutdown has been scheduled well in advance.
2. The scheduled downtime is a ground event that has been preplanned.
3. All affected personnel have been notified well in advance that the downtime will occur.
4. The shutdown has been scheduled for off hours to alleviate the operational impact that may occur.
5. The order of shutting down the system has been determined in advance.
    a. In coming requests
    b. PDPS
    c. Data Server
    d. Ingest

e. Archive

f. Client

g. MSS

6. All proper personnel are available to aid in the shutdown process. The System Administrator will be trained to conduct the shutdown by himself. However, there will be ample time for the Operations Supervisor to schedule any personnel that is deemed necessary.

7 Each subsystem has provided a shutdown script that will shutdown the services of that subsystem.

8. HP OpenView is configured to conduct its polling every minute.

9. A back up of the system was taken prior to the initialization of the shutdown process (please see Scenario 3.1.2 Computer System Administration Backup & Restore/Recovery Scenario)

10. Z-mail is the E-mail application provided to all operators in Release A.

11 We assume that there are no problems that arise during the shutdown process. If a problem were to arise the systems Administrator would generate a Trouble Ticket outline the problem (Please see Scenario 3.2.1 Trouble Ticket and Problem Tracking Scenario)

3.1.1.4a Components

Figure 3.1.1.4a-1 indicates the interaction between the DAAC personnel and the ECS subsystems.

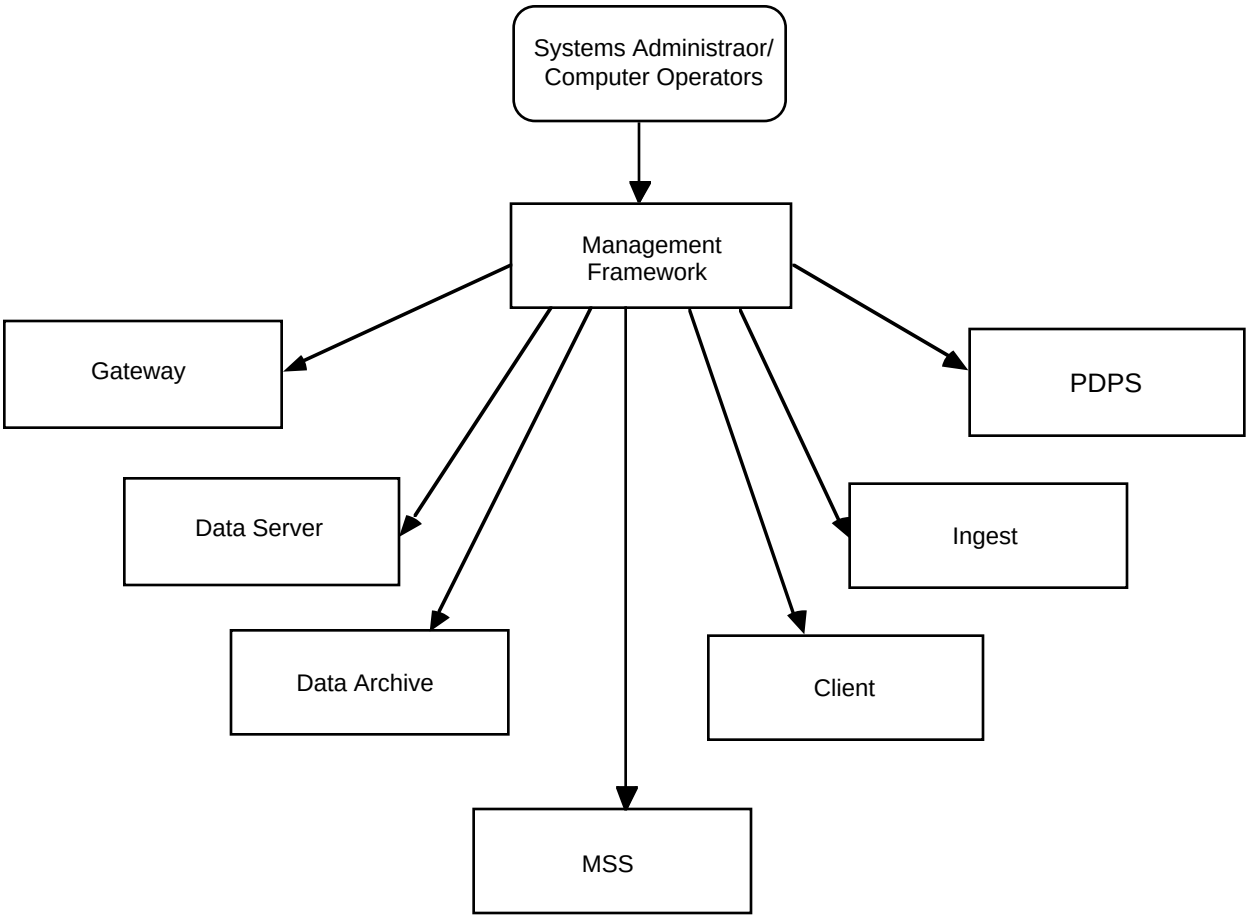

Figure 3.1.1.4a-1. ECS System Shutdown Scenario Components

3.1.1.5a Preconditions

The following preconditions are assumed for this scenario:

1. The shutdown has been scheduled well in advanced.
2. The planning involved has been concluded well in advance.
3. The Systems Administrator will be trained to shutdown all aspects of the system.

3.1.16a Detailed Steps of Process

Table 3.1.1.6a-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.1.1.6a-1. ECS System Shutdown Process (1 of 2)

Step	Duration	User	Operator Action	System	Figure
1	< 1 Time = 0230			System sends out a notice to all operators that the system will be shutting down in T-30 minutes.	3.1.1.6b-1 3.1.1.6b-16
2	< 1 Time = 0245			System sends out a notice to all operators that the system will be shutting down in T-15 minutes.	3.1.1.6b-2 3.1.1.6b-16
3	< 1 Time = 0259			System sends out a notice to all operators that the system will be shutting down in T-1 minute.	3.1.1.6b-3 3.1.1.6b-16
4	< 1 Time = 0300			At Shutdown system no longer allows in coming requests	
5	5 - 10 Time = 0310		System Administrator then waits for all jobs to complete. If a job running will take longer than 10 minutes to complete the job will be stopped and originator will be notified. The Systems Administrator will perform a “PS” command to verify that all processes have completed. The SA will perform an “PS” command to verify that all processes have completed.	System completes all jobs.	
6	< 1 Time = 0311		The system administrator then shuts down the PDPS.	System shuts down PDPS.	
7	5 Time = 0316		System Administrator monitors HP OpenView to see when the PDPS has shut down.	PDPS Icon turns red on HP OpenView	3.1.1.6b-4

8	< 1 Time = 0317		The System Administrator then shuts down the Data Server (s).	System shuts down Data Server.	

Step	Duration	User	Operator Action	System	Figure
9	5 Time = 0322		System Administrator monitors HP OpenView to see when the Data Server has shut down.	Data Server Icon turns red on HP OpenView	3.1.1.6b-5
10	< 1 Time = 0323		The System Administrator then shuts down Ingest subsystem.	System shuts down Ingest.	
11	5 Time = 0328		System Administrator monitors HP OpenView to see when the Ingest Subsystem has shut down.	Ingest Subsystem Icon turns red on HP OpenView	3.1.1.6b-6
12	< 1 Time = 0329		The System Administrator then shuts down the Data Archive.	System shuts down Data Archive.	
13	5 Time = 0334		System Administrator monitors HP OpenView to see when the Data Archive Subsystem has shut down.	Data Archive Subsystem Icon turns red on HP OpenView	3.1.1.6b-7
14	< 1 Time = 0335		The System Administrator then shuts down the Client software.	System shuts down the Client software.	
15	5 Time = 0340		System Administrator monitors HP OpenView to see when the Client software has shut down.	Client Software Icon turns red on HP OpenView	3.1.1.6b-8
16	< 1 Time = 0341		The System Administrator then shuts down the MSS Subsystem.	System shuts down the MSS Subsystem.	
17	5 Time = 0346			Unix prompt appears	

3.1.1.7a Postconditions

The Unix prompt is on the monitor and the system is awaiting the required action.

3.1.1.1b Startup Scenario Description

We have broken the scenario down into two unique parts. The first scenario covers shutdown and the second scenario covers startup. In this example, the Systems Administrator is the ECS personnel involved. The definitions and roles of the Systems Administrator are taken from the Maintenance and Operations Manual for the ECS Project 607-CD-001-001) and/or The Maintenance and Operations Configuration Management Plan for the ECS Project. The reason that only the Systems Administrator is required is because we are assuming that the shutdown has been scheduled well in advance, it will occur during off hours and the Systems Administrator has been properly trained to handle all aspects of a system shutdown. In this scenario the Systems Administrator initializes the master startup script. The System Administrator then monitors HP OpenView as the script runs to insure that everything is running smoothly. Upon completion of the startup, the Systems Administrator notifies the Operators and Resource Manager that the system has been started and is ready for processing. The Computer Operators receive a message from the Systems Administrator notifying them that the System is up and running.

3.1.1.2b Frequency

We estimate that during the early stages of ECS this will occur once every 3-4 months. However after the system stabilizes we estimate that this will occur more like once a year.

3.1.1.3b Assumptions

The assumptions underlying this scenario (startup) are as follows:

1. The startup takes place after a scheduled shutdown.
2. The order of the startup is the inverse of the shutdown.
3. All proper personnel are available to aid in the shutdown process. The System Administrator will be trained to conduct the shutdown by himself. However, there will be ample time for the Operations Supervisor to schedule any personnel that is deemed necessary.
4. A master startup script exists, which calls the individual subsystem scripts in the predefined order.
5. Each subsystem has provided a startup script that will startup the services of that subsystem.
6. The MSS Agent provides the communications within the startup process, but the subsystems provide their own unique startup script.
7. HP OpenView is configured to conduct its polling every minute.
8. Z-mail is the E-mail application provided to all operators in Release A.

9. We assume that there are no problems that arise during the shutdown process. If a problem were to arise the systems Administrator would generate a Trouble Ticket outline the problem (Please see Scenario 3.2.1 Trouble Ticket and Problem Tracking Scenario)

3.1.1.4b Components

Figure 3.1.1.4b-1 indicates the interaction between the DAAC personnel and the ECS subsystems.

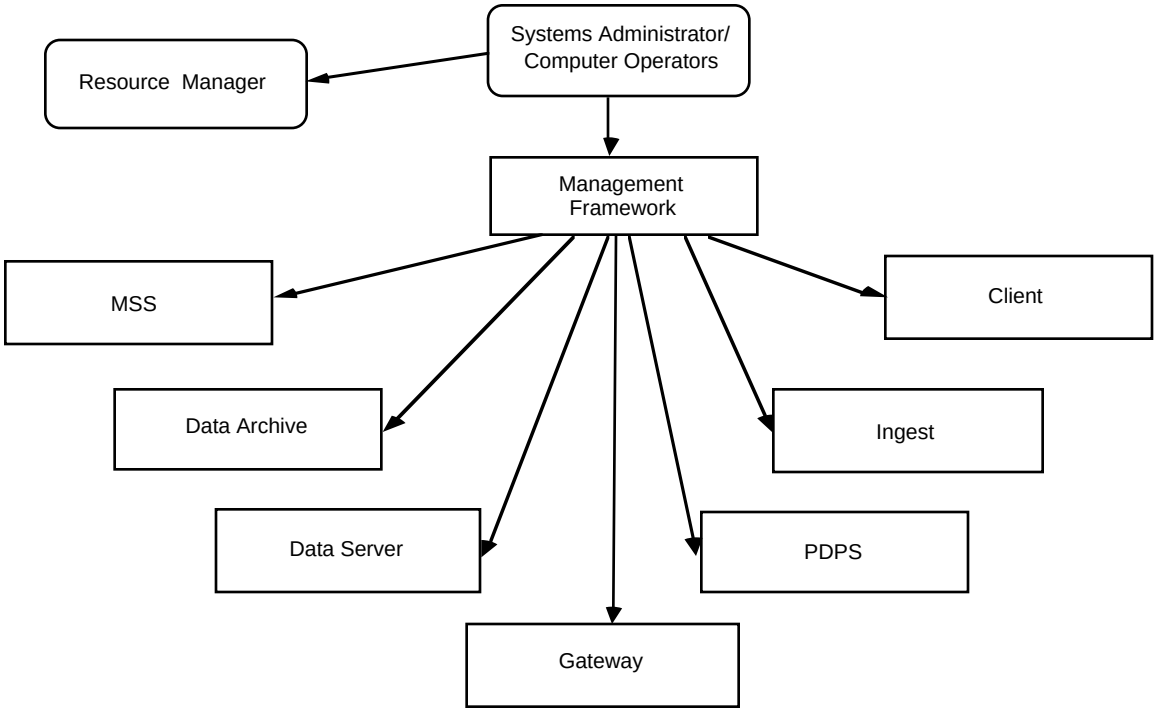

Figure 3.1.1.4b-1. ECS System Startup Scenario Components

3.1.1.5b Preconditions

The following preconditions are assumed for this scenario:

1. The startup has been scheduled well in advanced, following the planned shutdown.
2. The planning involved has been concluded well in advance.
3. The Systems Administrator will be trained to startup all aspects of the system.

3.1.16b Detailed Steps of Process

Table 3.1.1.6b-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.1.1.6b-1. ECS System Startup Process (1 of 2)

Step	Duration	User	Operator Action	System	Figure
1	< 1 Time = 0500		System Administrator initializes the script to startup the system.	Executes the Startup Script	
2	< 1 Time = 0501			MSS Agent is initialized	
3	< 1 Time = 0502			Agent calls the Client startup script	
4	5 Time = 0507			Client software is started	3.1.1.6b-9
5	< 1 Time = 0508			Agent calls the Data Archive Subsystem startup script	
6	5 Time = 0513			Data Archive Subsystem is started	3.1.1.6b-10
7	<1 Time = 0514			Agent calls the Ingest startup script	
8	5 Time =0519			Ingest Subsystem is started	3.1.1.6b-11
9	< 1 Time = 0520			Agent calls the Data Server startup script	
10	5 Time = 0525			Data Server Subsystem is started	3.1.1.6b-12
11	<1 Time = 0526			Agent calls the PDPS startup script	
12	5 Time = 0531			PDPS Subsystem is started	3.1.1.6b-13
13	<1 Time = 0532			Agent Opens the Gateway to allow for incoming requests	

Step	Duration	User	Operator Action	System	Figure
14	5 Time = 0537		System Administrator monitors HP OpenView to insure that all of the Subsystems have been initialized. Administrator will see all of the components turn green.	HP OpenView shows that all of the subsystems are up and running without any problems.	3.1.1.6b-14
15	<1 Time = 0538		System Administrator sends out a message to all operators and the resource manager notifying them that the System is up and running.	Pop Up Message	3.1.1.6b-15 3.1.1.6b-16

3.1.1.7b Postconditions

The System is up and running and ready for processing to begin.

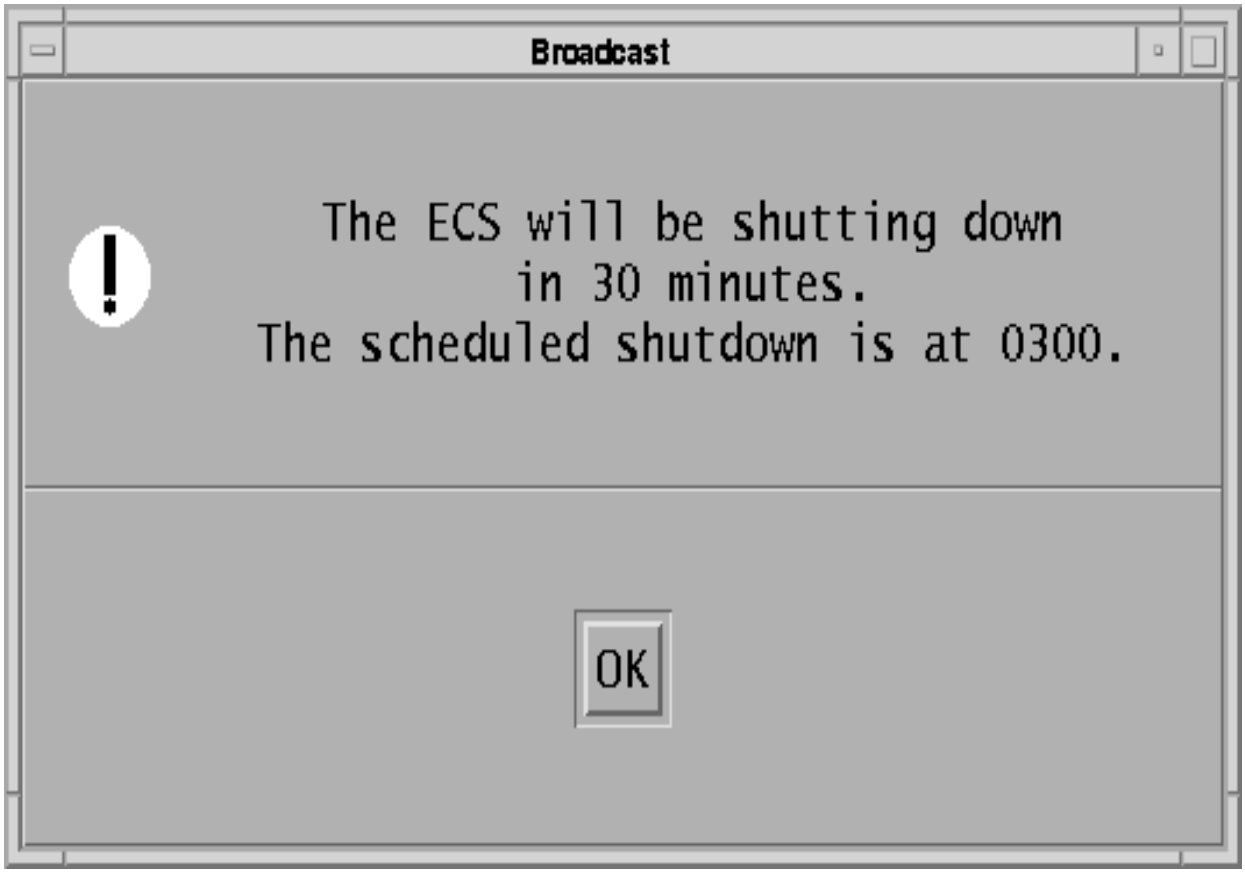

Figure 3.1.1.6b-1. Broadcast Message 1

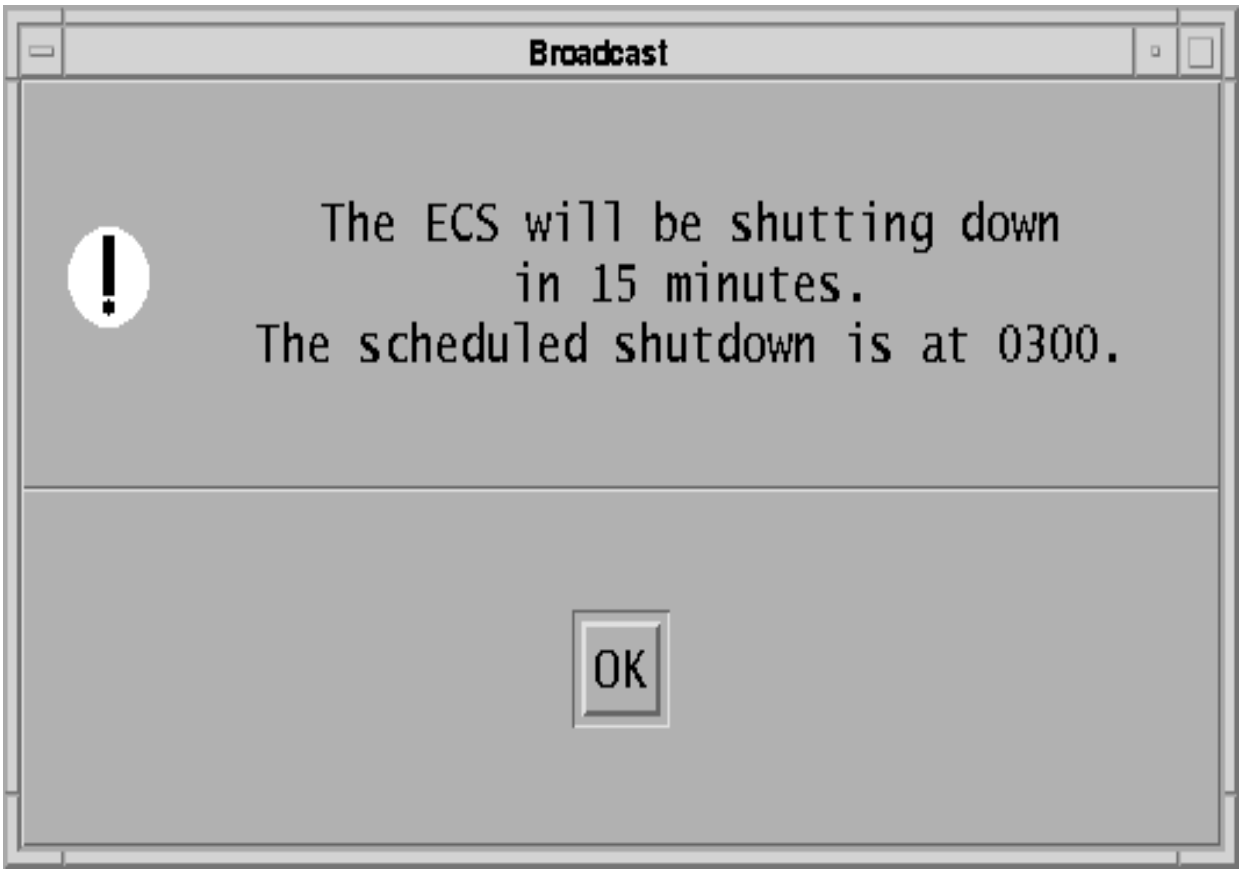

Figure 3.1.1.6b-2. Broadcast Message 2

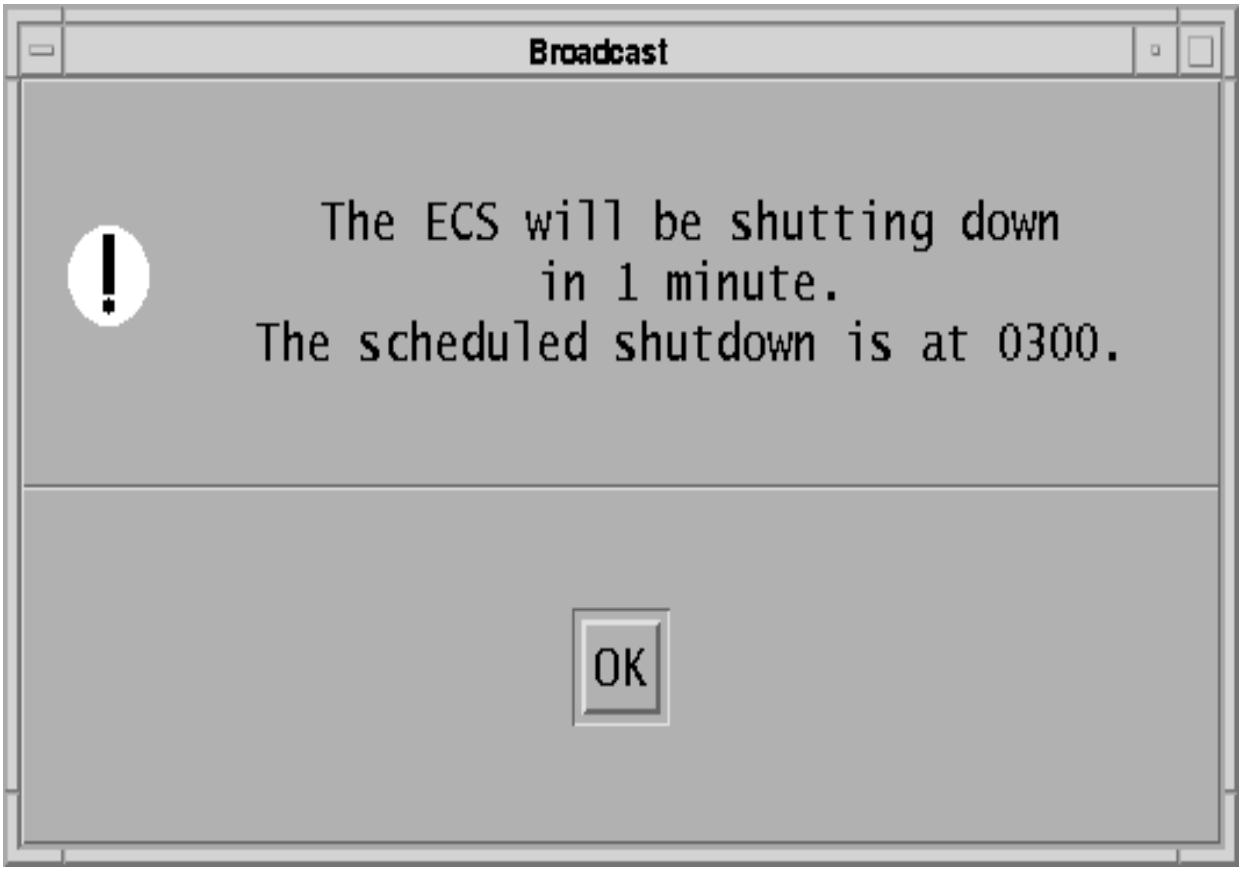

Figure 3.1.1.6b-3. Broadcast Message 3

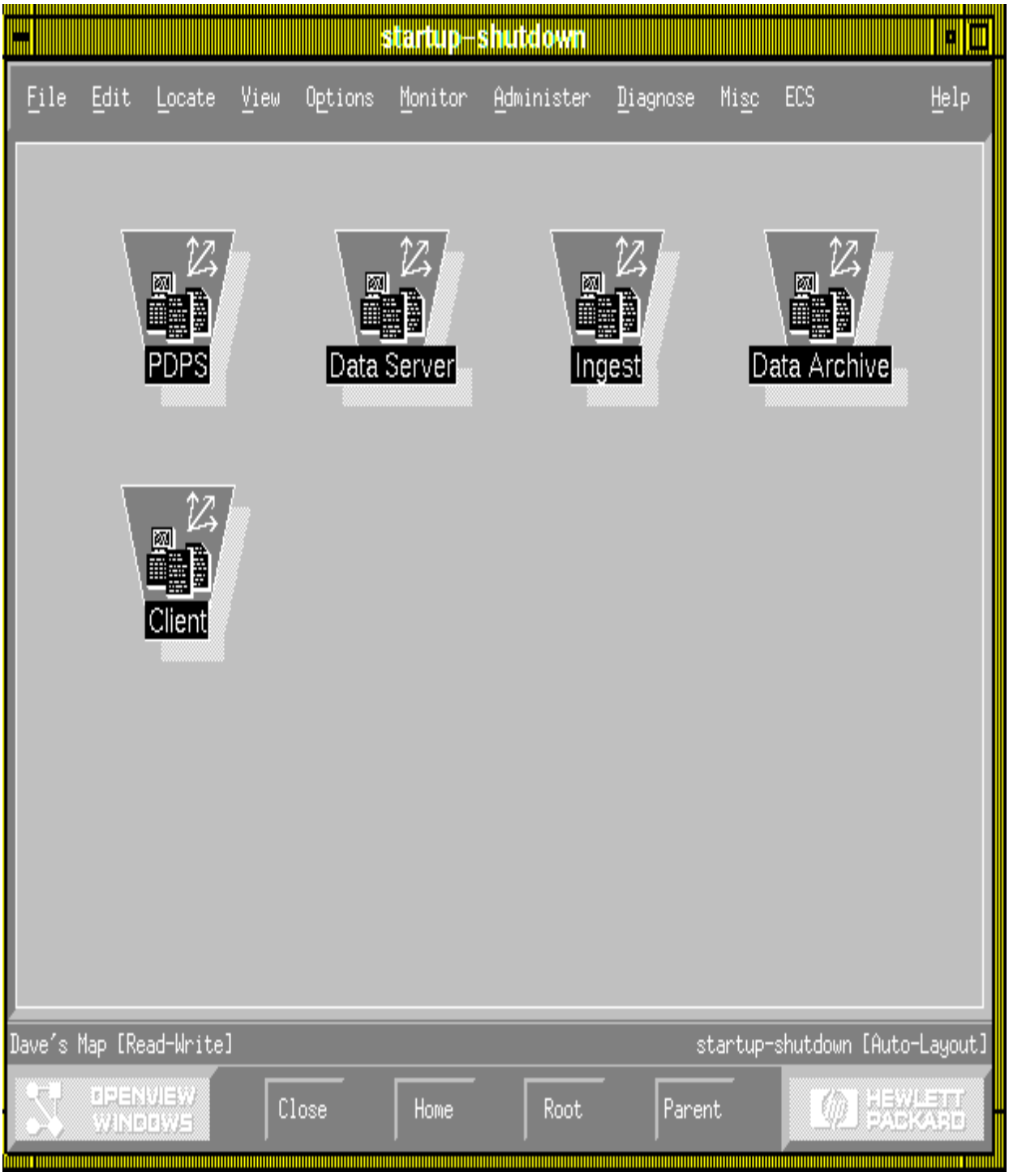

Figure 3.1.1.6b-4. HP OpenView Status 1

Figure 3.1.1.6b-5. HP OpenView Status 2

Figure 3.1.1.6b-6. HP OpenView Status 3

Figure 3.1.1.6b-7. HP OpenView Status 4

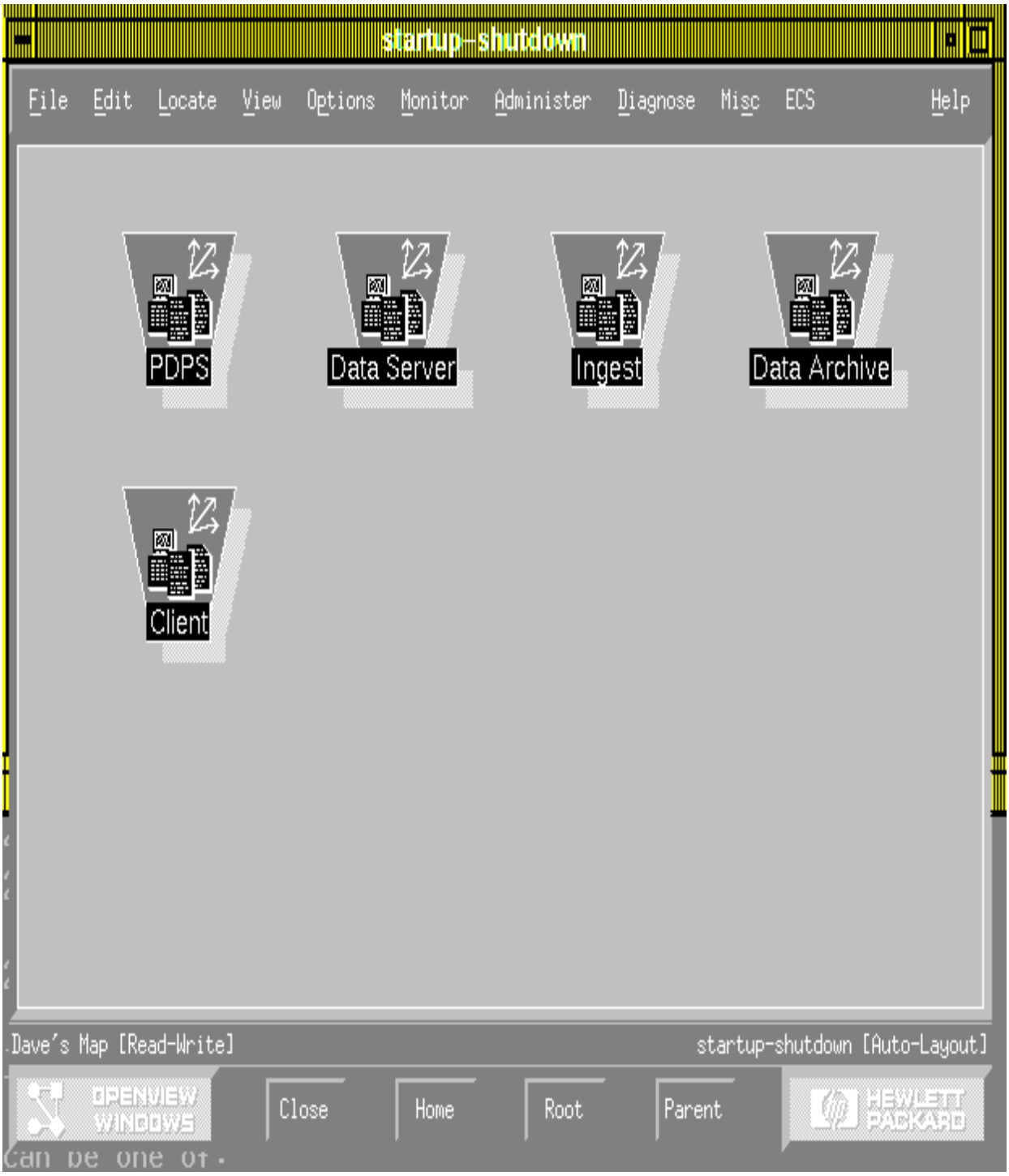

Figure 3.1.1.6b-8. HP OpenView Status 5

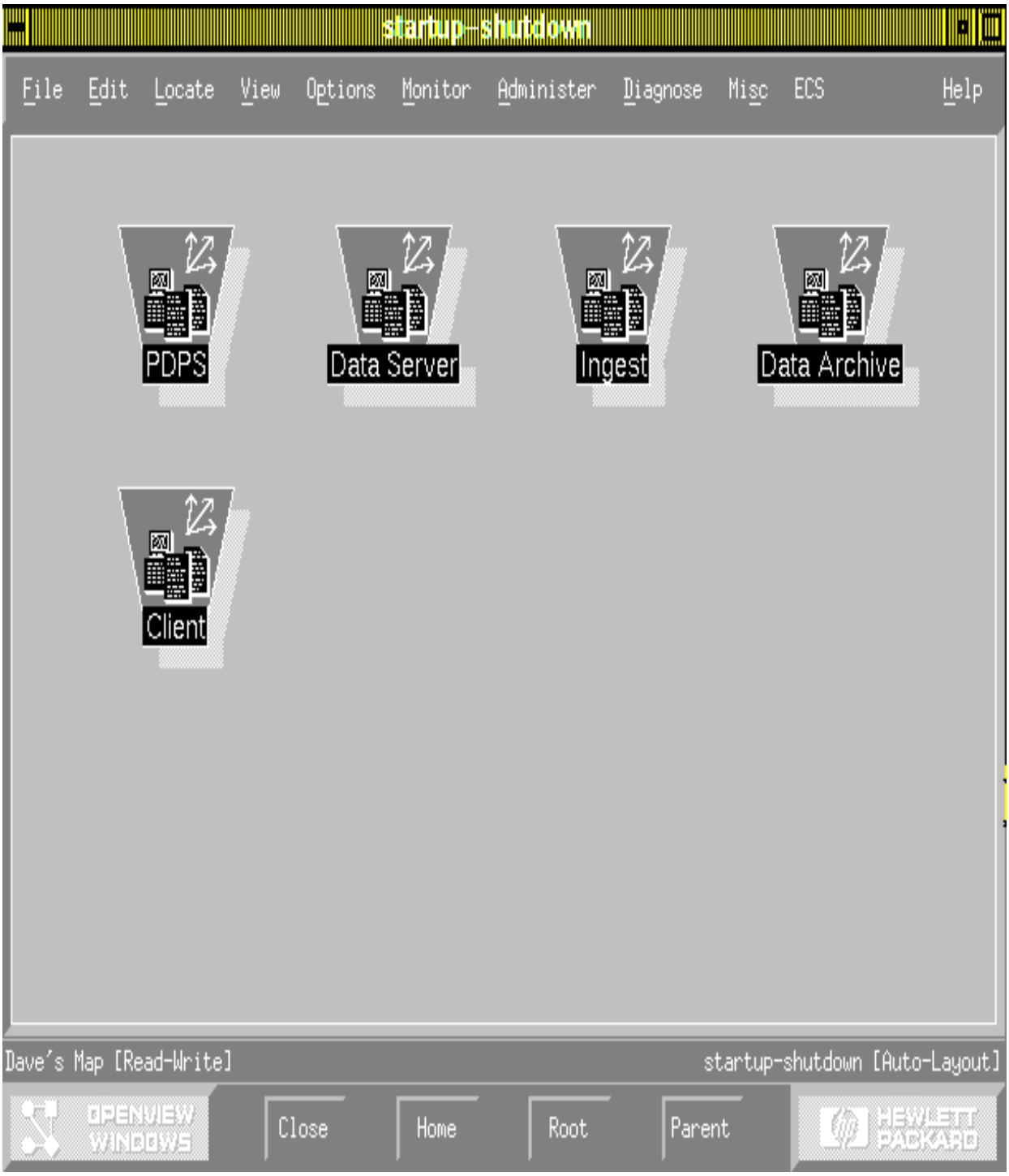

Figure 3.1.1.6b-9. HP OpenView Status 6

Figure 3.1.1.6b-10. HP OpenView Status 7

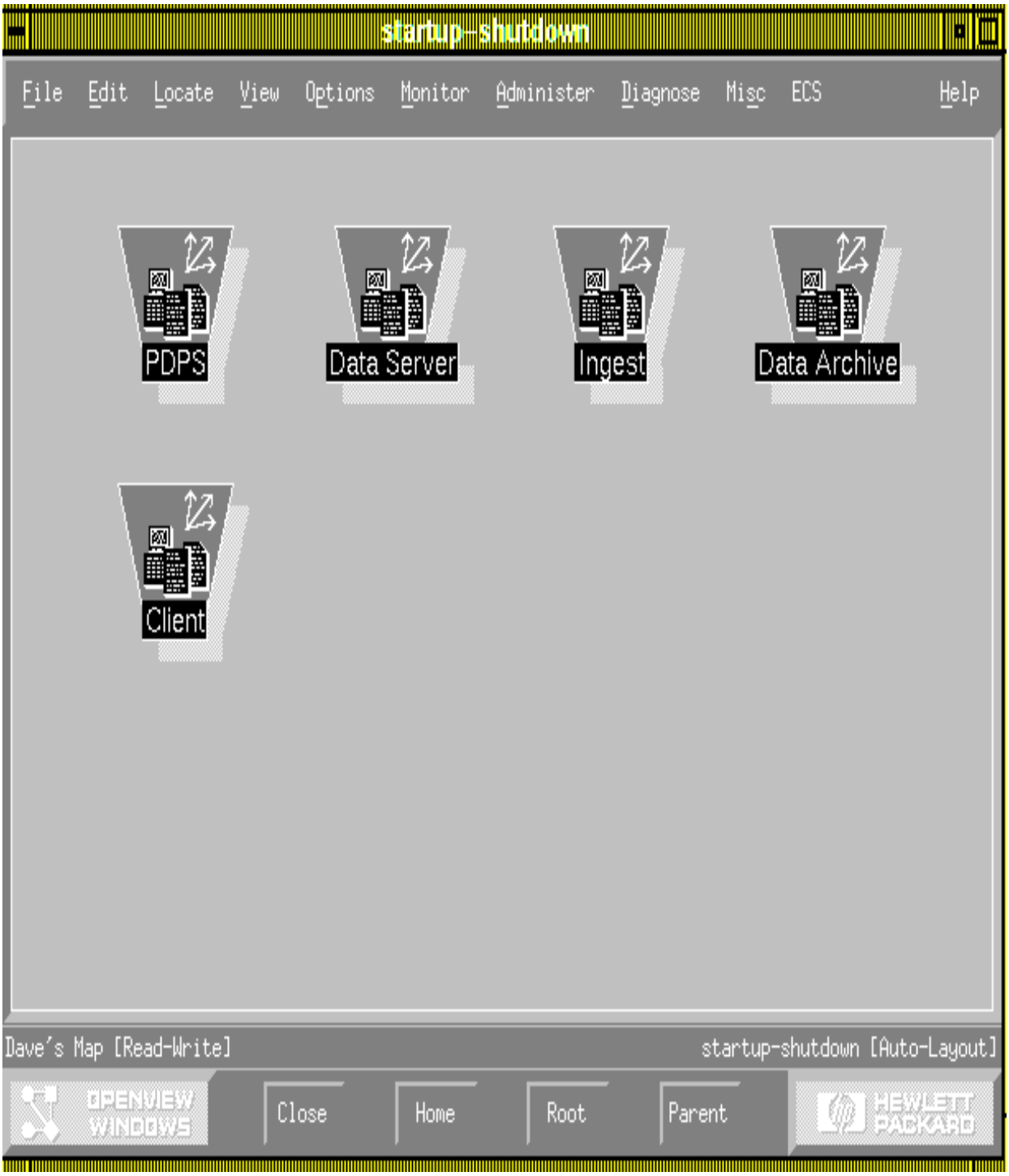

Figure 3.1.1.6b-11. HP OpenView Status 8

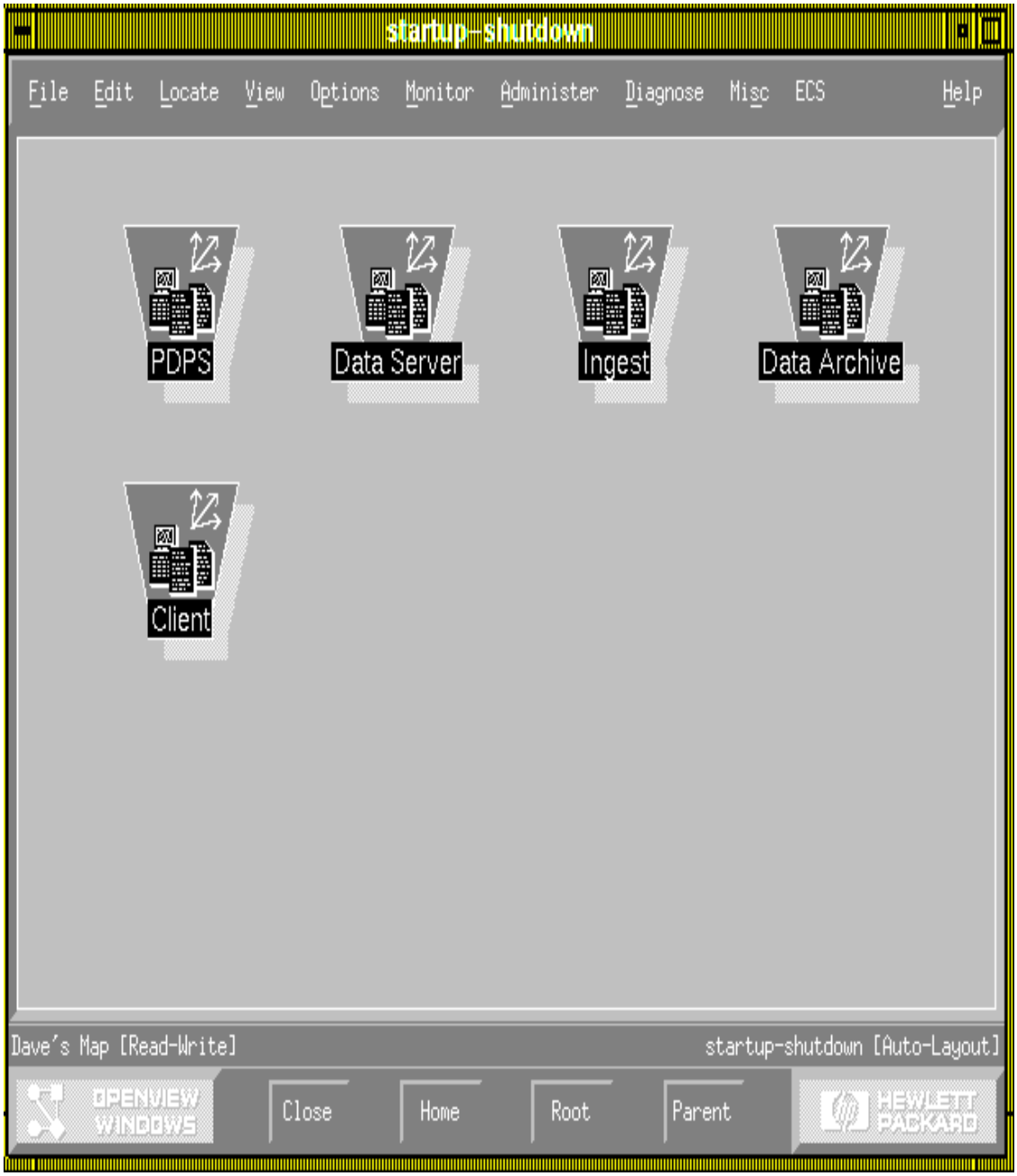

Figure 3.1.1.6b-12. HP OpenView Status 9

Figure 3.1.1.6b-13. HP OpenView Status 10

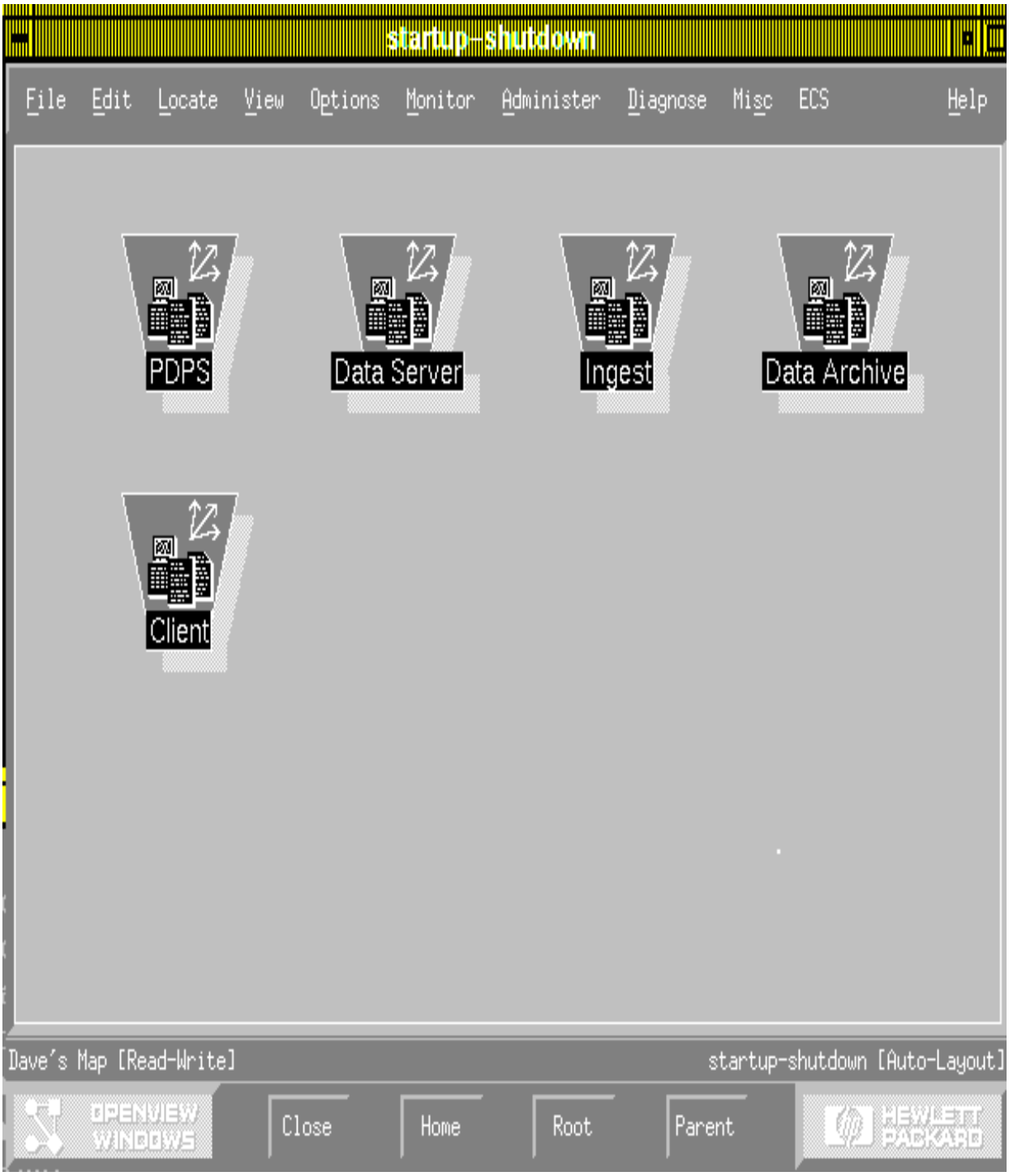

Figure 3.1.1.6b-14. HP OpenView Status 11

Figure 3.1.1.6b-15. Broadcast Message 4

Figure 3.1.1.6b-16. E-Mail Composition

3.1.2 Computer System Administration Backup & Restore/Recovery Scenario

3.1.2.1 Scenario Description

This scenario contains three separate activities. In this example, there are a variety of different ECS personnel involved. The definitions and roles of the participating staff members are taken from the Maintenance and Operations Manual for the ECS Project 607-CD-001-001) and/or The Maintenance and Operations Configuration Management Plan for the ECS Project. In the incremental backup scenario the Resource Manager and Production Monitor coordinate the scheduling of the backup. The backup is schedule to take place at midnight every day and autosys handles the backup automatically. The Operator reviews the QA report associated with the backup. The operator then invokes the word processor for the log file and makes the entry into the log file indicating the status of the backup. In the second phase of the scenario, Remedy has incurred a fault in one of its configuration files and it must be restored from the previous days backup. The Operator schedules the restore with the coordination of the Resource manager and Production Monitor. Operator notifies the users of the problem and lets them know when the restore will take place. Operator initializes the scripts to begin the restore. Operator prints out a copy of the corresponding log file and compares it to the QA report associated with the backup that has been restored. Operator then notifies the users that Remedy has been restored from the Day 2 1100 backup. In the third phase of this scenario, a disc crashes and a full system restore is required. Operator indicates that a severe fault has occurred and that a system restore is required. The operator in coordination with the Resource Manager and Production Monitor schedules the time for the restore. Operator notifies the users of the problem and lets them know when the restore will occur. The previous system backup is retrieved from the Archival facility and it is restored. The operator compares the log file with the QA reports corresponding to the system backup that is being restored. Operator notifies the users that the system has been restored using the previous system backup and that all processing using the crashed machine, that was conducted after the restored backup will need to be redone.

3.1.2.2 Frequency

There are two types of backups (incremental and system), each one having a unique frequency. The incremental backups are run daily and the system backups are run weekly. There are two types of restores/recoveries (partial and full), each one with a unique frequency. We would expect that in the beginning stages of a releases operational life that a partial restore/recovery may be conducted once a week and that a full restore/recovery will be conducted twice a year.

3.1.2.3 Assumptions

The assumptions underlying this scenario are as follows:

1. The backup that we will be dealing with is an incremental backup.
2. Since we are dealing with incremental backup, the backup would have already been scheduled. Therefore Autosys will automatically begin to conduct the

3. The frequency at which both incremental and system backups will occur is procedural. The frequency stated above is our best analyses at this time and will be reassessed after normal operations begin to reflect better realtime statistics.
4. The backup that was conducted in steps 1-10 can be used for the restore/recovery.
5. Scripts have been developed to aid the operators in both the backup and restore/recovery process.
6. At this time the requirements regarding science data, state that all ECS science data will be backed up. ECS science data is defined as AM-1 and PM-1 data. Since this data does not exist until the Release B timeframe, there is presently no need to back up science data in Release A.
7. We are not covering the trouble ticketing processes
8. The procedures involved with the execution of the incremental and complete system backups are similar except for the scripts that are used and the frequency in which they are run.
9. The QA report has been generated and saved.
10. The Computer Operator has modified the login message, so that when a new user logs in to the system they will be aware of the upgrade and notified as to what part of the system is affected.

3.1.2.4 Components

Figure 3.1.2.4-1 indicates the interaction between the DAAC personnel and the ECS subsystems.

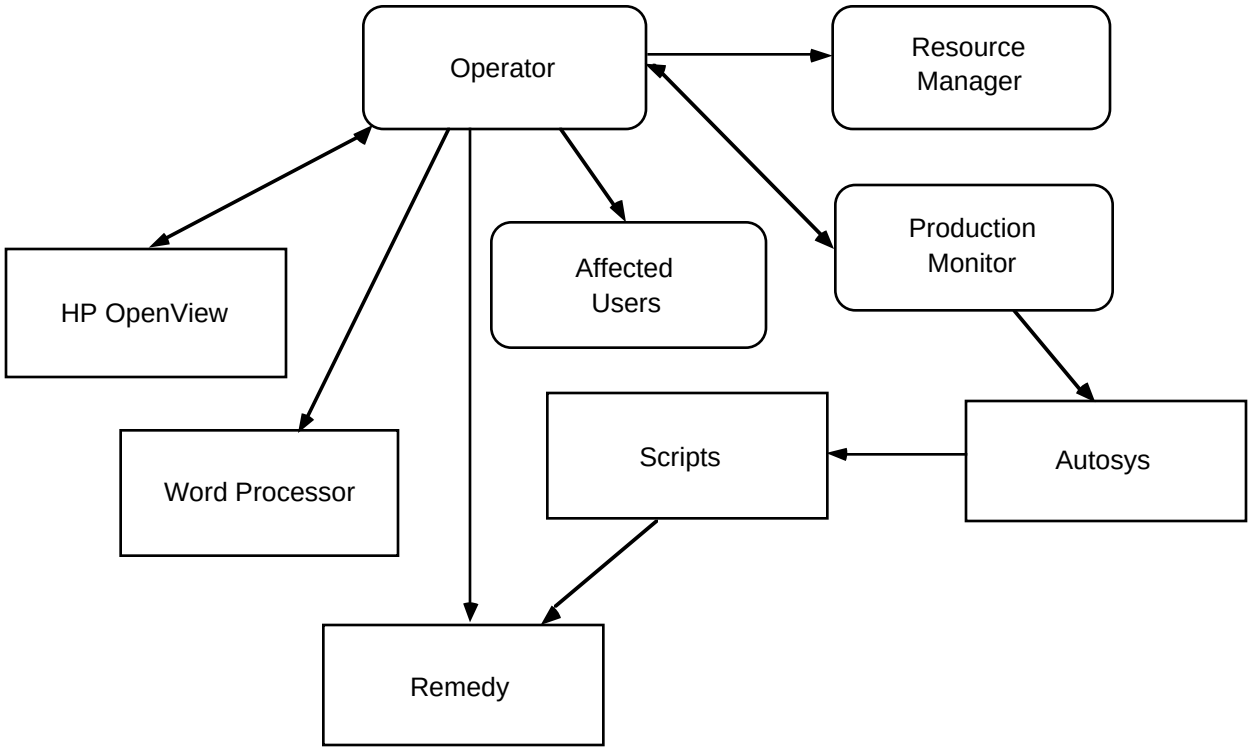

Figure 3.1.2.4-1. Computer System Administration Backup and Restore/Recover Scenario Components

3.1.2.5 Preconditions

The following preconditions are assumed for this scenario:

1. Scripts will be used to conduct the backups.
2. Scripts will be used to perform the restore/recovery.
3. The scripts will be developed and are provided by the subsystem development organizations.
4. Incremental Restore ==> From previous analysis and experience it is determined that the problem that exists is that Remedy has crashed.

3.1.2.6 Detailed Steps of Process

Table 3.1.2.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.1.2.6-1. Computer System Administration Backup and Restore/Recover Process (1 of 5)

Step	Duration	User	Operator Action	System	Figure
1	15 Time = 0000			Autosys begins the incremental backup of the software.	
2	<1 Time = 0800		Invokes word processor Goes to the “File” pulldown menu and selects open. Opens the previously saved QA report.	Displays QA report on the terminal	
3	10 Time = 0801		Operator reviews the QA report.		
4	<1 Time = 0811		Operator invokes the word processor, goes to the file Pulldown menu and selects open. Operator moves to the backup directory and selects the backupxxxxxx .log (where xxxxxx is equal to month, day, and year of the backup) and enters in the vital information (I.e., date, time, reason for backup, etc.) via free form text.	Displays log file on terminal.	
5	2 Time = 0812		Makes log file entry indicating status of backup.	Stores entry to log file.	
6	3 Day 2 Time = 1100			While generating a trouble ticket Remedy crashes.	3.1.2.6-1
7	15 Time = 1104		The operator determined that a configuration file in Remedy was erroneously updated.		
8	1 Time = 1119		Operator determines that a restore of the configuration file from the previous days backup will fix the problem.		

Step	Duration	User	Operator Action	System	Figure
9	2 Time = 1120		The operator notifies any affected users (via e-mail) that the system has crashed and a restore is scheduled for 1200. The affected users would be any users that are logged onto the system at this time.	System sends e-mail.	3.1.2.6-1
10	<1 Time = 1200		The operator Enters the commands to initialize the scripts to begin the restore.	System initializes the scripts to restore the software.	
11	3 Time = 1201		Operator invokes the word processor and moves to the backup directory, to review the log file associated with the backup being restored.	Displays log file on terminal.	
12	2 Time = 1202		Operator selects the backupxxxxxx.log file (where xxxxxx represents the month, day, and year of the backup)	System displays appropriate log file.	
13	2 Time = 1204		Operator prints out a copy of the log file.	prints log file.	
14	<1 Time = 1206		Operator exits the log file directory.	System returns to word processor.	
15	3 Time = 1207			Restore concludes and an indicator is returned to the operator.	
16	1 Time = 1210		Operator notices the indicator and realizes that the restore has concluded.		

17	1 Time = 1211		Operator (from the word processor that is already up) opens the file pull down menu and selects open. Then opens the associated QA report.	System displays QA report.	

Step	Duration	User	Operator Action	System	Figure
18	10 Time = 1221		Operator compares the QA report with the Log file from the backup that was restored.		
19	5 Time = 1231		Operator submits a test Trouble Ticket to verify that Remedy is functioning correctly.		3.1.2.6-1
20	<1 Time = 1236	Affected Users receive the e-mail message sent from the operator.	Operator notifies (via e-mail) the users that the restore has concluded, and submits a Trouble Ticket outlining the original problem (even though the Trouble Ticket will be closed immediately). This message will be reported to all of the affected users (Step 9).	System delivers e-mail.	3.1.2.6-4
21	Day 5 Time = 1900			A Disc crashes.	
22	1 Time = 1905		Operators beeper goes off indicating that a problem exists.		

23	5 Time = 1906		Operator views OpenView and notices that the GSFC icon is red. Operator double clicks on the GSFC Icon to go down to the next level of submaps. At the GSFC submap the DMGHW-GSFC-1 is Red. Operator double clicks on the DMGHW-GSFC-1 Icon and the DMGHW-GSFC-1 Submap appears. The operator views the red disk drive. The operator tries to write to the disk and his write fails. The operator determines that the disk has crashed.		3.1.2.6-5

Step	Duration	User	Operator Action	System	Figure
24	2 Time = 1911	The Resource Manager and the Production Monitor schedule the restore/recovery with the operator.	The operator schedules the replacement and restore of the disc with the Resource Manager and the Production Monitor. (Based on the resources needed and the time required to conduct the restore the event is scheduled.)		
25	<1 Time = 0100	Affected Users receive e-mail notifying them that the systems has crashed and that the restore will take place at 0100.	The operator notifies all affected users (via e-mail) that the system has crashed and a restore is scheduled for 0100. This message also indicates which date the backup that will be used was taken. Thus notifying the users of any work that may have been lost.	System sends e-mail.	3.1.2.6-3
26	60 Time = 0101		The backup, which is stored in a different facility, is retrieved by the operator.		
27	<1 Time = 0201		The operator Enters the commands to initialize the scripts to begin the restore.	System initializes the scripts to restore the disc.	
28	10 Time = 0202		Operator invokes the word processor and selects “Open” from the file pull down menu to review the log file associated with the backup being restored.	Displays log file on terminal.	
29	3 Time = 0212		Operator selects the Restorexxxxxx.log file (where xxxxxx equals the Month, Day and Year)	System displays appropriate log file.	

30	3 Time = 0215		Operator prints out a copy of the log file.	prints log file.	
31	1 Time = 0218		Operator exits the log file directory.	System returns to word processor.	

Step	Duration	User	Operator Action	System	Figure
32	5 Time = 0219			Restore concludes and an indicator is returned to the operator.	
33	2 Time = 0224		Operator notices the indicator and realizes that the restore has concluded.		
34	45 Time = 0226		Operator then restores the incremental backups, taken since the last system backup, on top of the restored system backup to bring the system as close to realtime as possible. (To determine the latest incremental backups, the operator opens the inc_bkup.doc file from the word processor and views a list of the latest incremental backups.		
35	1 Time = 0311		Operator (from the word processor that is already up) initializes the QA report associated with the restore.	System displays QA report.	
36	15 Time = 0312		Operator compares the QA report with the Log file from the backup that was restored.		
37	5 Time = 0327		Operator verifies that the system is back up and operational.		
38	<1 Time = 0332	Affected users receive the e-mail message sent from the operator.	Operator notifies (via e-mail) the affected users that the restore has concluded and that activities that were performed before Day 5 at 1900 may need to be redone.	System delivers e-mail.	3.1.2.6-4

3.1.2.7 Postconditions

For the backup scenario the post condition is that the backup has been performed and the tape is stored in a different facility.

For the partial restore/recovery the backup from the previous day was retrieved from the storage area (a different facility) and the Remedy software was restored. ==> System is in an operation state with Remedy being restored to the time of the last backup.

For the system restore the system backup from the previous month was retrieved from the storage area and the system was restored. ==> System is in the normal operational state at the same point as the restore tape.

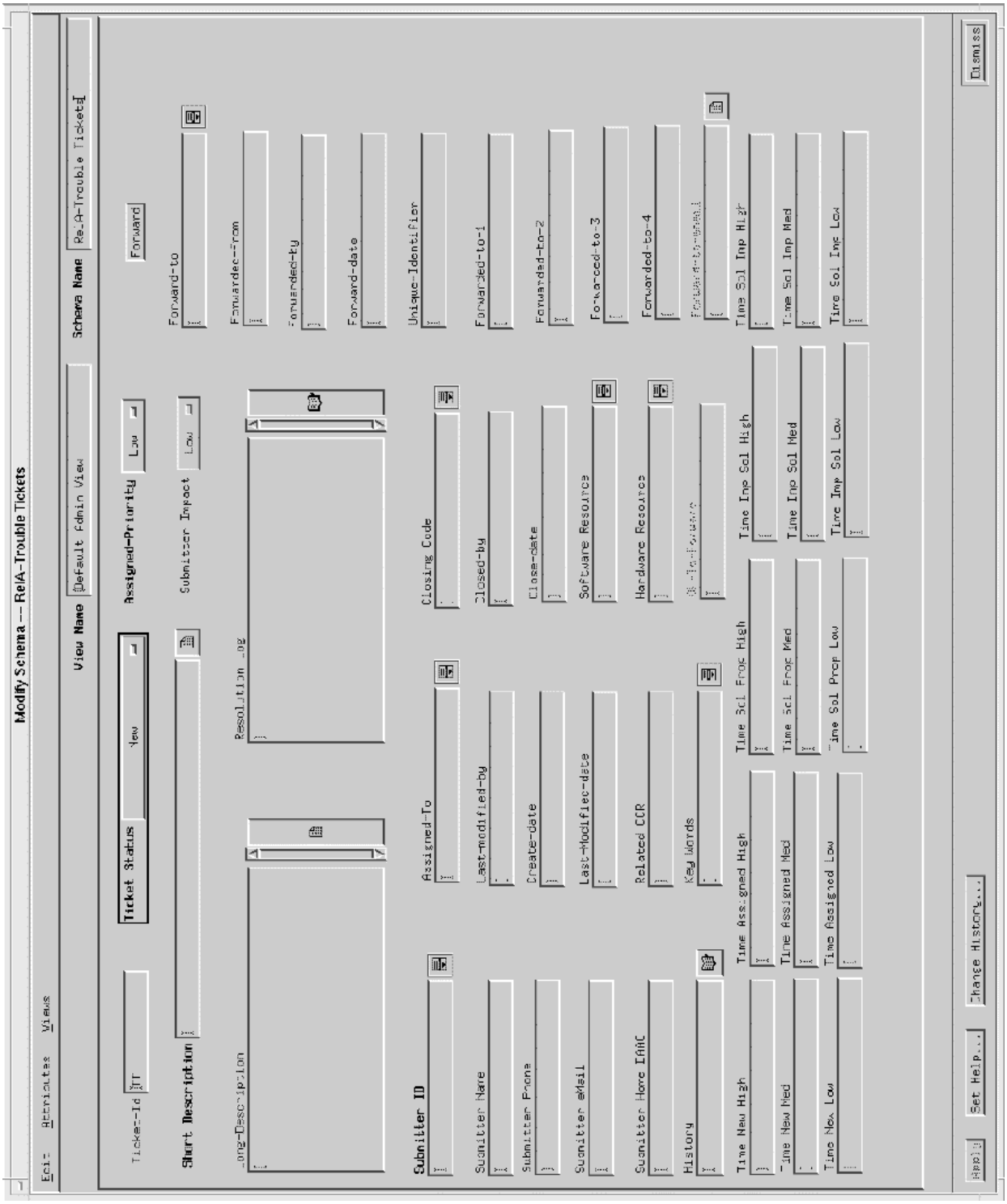

Figure 3.1.2.6-1. Remedy Trouble Ticket

Figure 3.1.2.6-2. Restore Notification

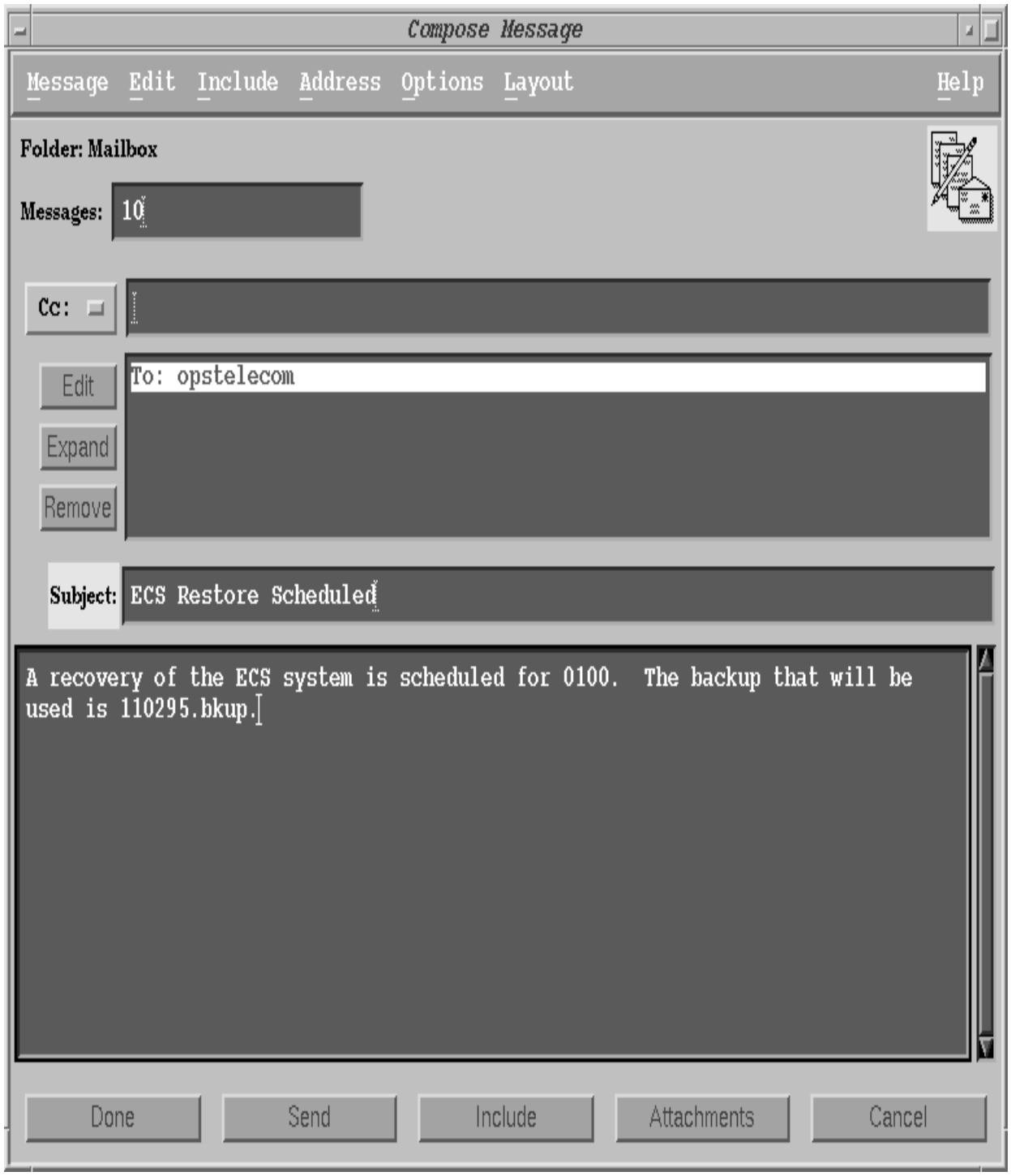

Figure 3.1.2.6-3. Recovery Notification

Figure 3.1.2.6-4. Restore Completed Notification

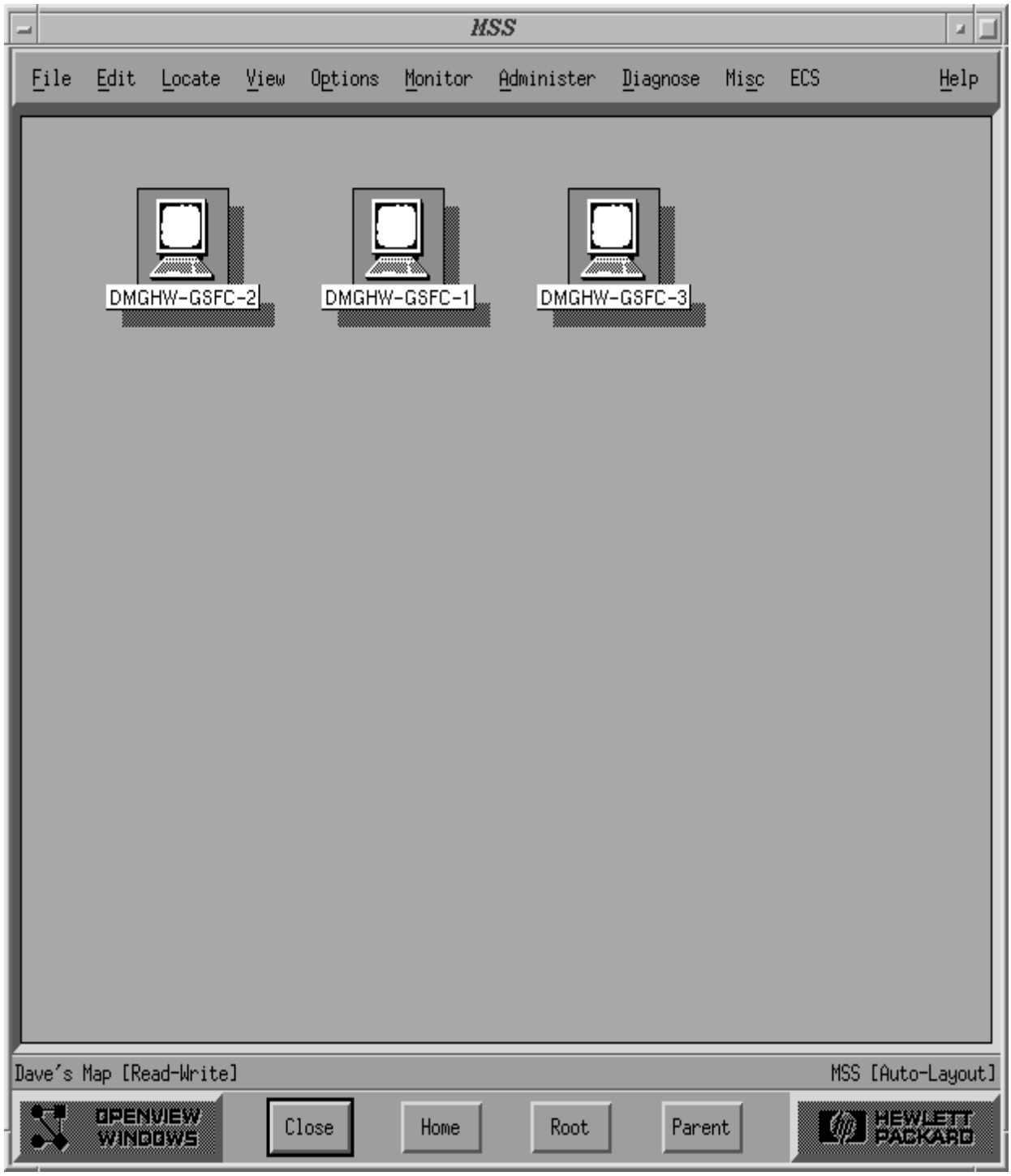

Figure 3.1.2.6-5. HP OpenView GSFC DMG Map